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Remarks

Claims 1-18 are pending in the application.

Claims 3, 12 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The drawings are objected to as being not readable.

Claims 1, 11, 16 and 18 are rejected under 35 U.S.C. 112, ¶1, as failing to comply with the enablement requirement.

Claims 1, 5-10 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,718,121 to Epworth et al. (hereinafter "Epworth") in view of U.S. Patent Application Publication No. 2004/0120356 to Davenport et al. (hereinafter "Davenport").

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Epworth in view of Davenport and further in view of U.S. Patent No. 7,092,645 to Sternowski et al. (hereinafter "Sternowski").

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Epworth in view of Davenport and further in view of U.S. Patent No. 6,907,052 to Kozlowski et al. (hereinafter "Kozlowski").

Claims 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Epworth in view of Davenport and further in view of U.S. Patent No. 6,692,973 to Huber et al. (hereinafter "Huber").

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Epworth in view of Davenport and further in view of Huber and further in view of U.S. Patent Publication No. 2002/0126346 to Suzuki et al. (hereinafter "Suzuki").

Each of the various rejections and objections are overcome by amendments that are made to the specification, drawing, and/or claims, as well as, or in the alternative, by various arguments that are presented.

Any amendments to any claim for reasons other than as expressly recited herein as being for the purpose of distinguishing such claim from known prior art are not being made with an intent to change in any way the literal scope of such claims or the range of

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equivalents for such claims. They are being made simply to present language that is better in conformance with the form requirements of Title 35 of the United States Code or is simply clearer and easier to understand than the originally presented language. Any amendments to any claim expressly made in order to distinguish such claim from known prior art are being made only with an intent to change the literal scope of such claim in the most minimal way, i.e., to just avoid the prior art in a way that leaves the claim novel and not obvious in view of the cited prior art, and no equivalent of any subject matter remaining in the claim is intended to be surrendered.

Also, since a dependent claim inherently includes the recitations of the claim or chain of claims from which it depends, it is submitted that the scope and content of any dependent claims that have been herein rewritten in independent form is exactly the same as the scope and content of those claims prior to having been rewritten in independent form. That is, although by convention such rewritten claims are labeled herein as having been "amended," it is submitted that only the format, and not the content, of these claims has been changed. This is true whether a dependent claim has been rewritten to expressly include the limitations of those claims on which it formerly depended or whether an independent claim has been rewriting to include the limitations of claims that previously depended from it. Thus, by such rewriting no equivalent of any subject matter of the original dependent claim is intended to be surrendered. If the Examiner is of a different view, he is respectfully requested to so indicate.

Objection to the Drawing

Figures 2(a) and 2(b) were objected to because they are not readable. Applicants submit, however, that these figures are actually legible "as is". They represent the eye diagrams of the signal after the post-amplifier, at linear operation and with gain clipping, respectively. Unlike the usual "open" eye diagrams that one may be more accustomed to, the eyes in Figs. 2(a)-(b) appear "closed" because of the existence of beat signal arising between the local oscillator (LO) signal ω_L and the incoming data signal ω_s (since the LO signal and the data signal are not phase-coupled).

Since Figures 2(a)-(b) reflect the nature of the actual data and are not illegible, Applicants respectfully request that the objection be withdrawn.

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Objection to Claims 3, 12 and 14

Claims 3, 12 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicant thanks the Examiner for indicating the allowable subject matter in these claims. However, as set forth below, Applicant submits that independent claims 1 and 11, from which claims 3, 12 and 14 depend, are allowable over the cited references. As such, claims 3, 12 and 14 are allowable in their dependent form.

Therefore, the Examiner's objection to claims 3, 12 and 14 should be withdrawn.

Rejection Under 35 U.S.C. 112

Claims 1, 11, 16 and 18 are rejected under 35 U.S.C. 112, ¶1, as failing to comply with the enablement requirement.

Claims 1, 11, 16 and 18 have been amended by replacing "baseband signal" with "first signal".

Therefore, the Examiner's rejection should be withdrawn.

Rejection Under 35 U.S.C. 103(a)**Claims 1, 5-10 and 16-18**

Claims 1, 5-10 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Epworth in view of Davenport. The rejection is traversed.

Claim 17 has been canceled, and its rejection is therefore moot.

Applicant submits that there is no motivation to combine Epworth and Davenport, and even if combined, these references would not have resulted in Applicant's invention.

The test under 35 U.S.C. §103 is not whether an improvement or a use set forth in a patent would have been obvious or non-obvious; rather the test is whether the claimed invention, considered as a whole, would have been obvious.

Independent claims 1, 16 and 18 have been amended to further clarify Applicant's invention. No new matter has been added as a result of these amendments.

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The Office Action acknowledged that Epworth fails to disclose certain signal processing such as post amplification and logic signal production. Thus, Davenport was cited for disclosing features corresponding to Applicants' gain clipped post amplifier and a decision circuit.

The Office Action further stated that a motivation for combining Epworth with Davenport is to create discernable binary data to be used by data processing at the receiver. Applicant disagrees that such a motivation exists.

Specifically, Epworth teaches a coherent optical receiver for optical communications, in which local oscillator intensity fluctuations are nulled out by cross-correlation with an imperfectly balance output to derive an error signal used in a feedback loop to optimize the balance (see Epworth's Abstract and Field of the Invention). There is nothing in Epworth to suggest any deficiencies in the balanced signal of the receiver as to require modifications, e.g., by using components from Davenport, to "create discernable binary data".

Davenport teaches a system applicable to data communications within a warning system (e.g., at railroad crossings) having sensors coupled to a microprocessor that uses the Controller Area Network (CAN) protocol (see Davenport's Abstract and Background). Davenport's full wave rectifier 600 and comparator circuit 900 were cited in the Office Action as corresponding to Applicant's gain clipped amplifier and data decision circuit, respectively. These circuit components are two out of five component blocks of Davenports' receiver circuit 500, which is used to convert an analog signal from a power supply line into a digital signal (para. 7, bottom of p.1 to top of p.2), and is part of a sensor module 104 for a railroad crossing flashing light sensor system (see Figs. 1-2).

As such, Davenport's components serve a different purpose in a technology that is vastly different from Epworth's receiver for optical communications.

Applicant submits that, absent any suggestion or teaching in either Epworth or Davenport, the Office Action's random selection and combination of components, which are designed for totally unrelated purposes, can only be a result of hindsight based on Applicant's disclosure.

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Furthermore, even if combined, Epworth and Davenport would not have resulted in Applicant's claimed invention because certain features in Applicants' invention are missing in both references.

For example, Epworth does not teach a tunable local oscillator (LO) in Figs. 1-7, or a gain clipped amplifier. Epworth's Fig. 5B shows the LO output as being subjected to intensity modulation, but this modulation does not provide any tunable LO. In fact, Epworth's LO has to be fixed so that a balanced signal can be provided for processing. Furthermore, Epworth does not teach any gain clipped amplifier.

Davenport's Fig. 5 shows a full wave rectifier 600 in a receiver circuit for a power line network. This full wave rectifier is not the same as a gain-clipped amplifier, and also produces a different result. For example, Applicant's gain-clipped amplifier leads to half-wave rectification (e.g., see Applicants' Fig. 1), while Davenport's rectifier results in full-wave rectification. Furthermore, the frequency regimes addressed in Davenport are on the order of 100kHz, which is significantly different from those used in optical communications.

Thus, even if Epworth's coherent optical receiver were to be combined with Davenport's full-wave rectifier and comparator circuit, the combined teaching would not have resulted in Applicant's receiver with a tunable oscillator circuit and a gain clipped amplifier, as arranged in Applicant's claim 1.

As such, Applicant submits that independent claim 1 is patentable over Epworth in view of Davenport under 35 U.S.C. 103(a). Independent claims 16 and 18 recite similar relevant limitations as recited in claim 1. As such, for at least the same reasons discussed above with respect to independent claim 1, independent claims 16 and 18 are also patentable over Epworth in view of Davenport under 35 U.S.C. 103(a).

Since all of the dependent claims that depend from the independent claims include all the limitations of the respective independent claims from which they ultimately depend, each such dependent claim is also patentable over Epworth in view of Davenport under 35 U.S.C. 103(a).

Therefore, the Examiner's rejection should be withdrawn.

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Claim 2

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Epworth in view of Davenport and further in view of Sternowski. The rejection is traversed.

The ground of rejection applies only to dependent claims, and is predicated on the validity of the rejection under 35 U.S.C. 103 given Epworth in view of Davenport. Since the rejection under 35 U.S.C. 103 given Epworth in view of Davenport has been overcome, as described hereinabove, and there is no argument put forth by the Office Action that Sternowski supplies all the features that are missing from Epworth in view of Davenport to render the independent claims obvious, this ground of rejection cannot be maintained. As such, claim 2 is patentable under 35 U.S.C. 103(a) over Epworth in view of Davenport and further in view of Sternowski.

Therefore, the Examiner's rejection should be withdrawn.

Claim 4

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Epworth in view of Davenport and further in view of Kozlowski. The rejection is traversed.

The ground of rejection applies only to dependent claims, and is predicated on the validity of the rejection under 35 U.S.C. 103 given Epworth in view of Davenport. Since the rejection under 35 U.S.C. 103 given Epworth in view of Davenport has been overcome, as described hereinabove, and there is no argument put forth by the Office Action that Kozlowski supplies all the features that are missing from Epworth in view of Davenport to render the independent claims obvious, this ground of rejection cannot be maintained. As such, claim 4 is patentable under 35 U.S.C. 103(a) over Epworth in view of Davenport and further in view of Kozlowski.

Therefore, the Examiner's rejection should be withdrawn.

Claims 11 and 13

Claims 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Epworth in view of Davenport and further in view of Huber.

Independent claim 11 recites relevant limitations similar to those recited in independent claims 1, 16 and 18. For at least the reasons discussed above with respect to

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the Examiner's rejection of claims 1, 16 and 18, claim 11 is patentable under 35 U.S.C. 103(a) over Epworth in view of Davenport.

Huber, which was cited in the Office Action as disclosing optical transmitters, a multiplexer, and a power splitter, fails to bridge the substantial gap between Epworth and Davenport and Applicant's invention.

As such, Applicant submits that independent claim 11 is patentable over Epworth in view of Davenport and further in view of Huber under 35 U.S.C. 103(a).

Since all of the dependent claims that depend from the independent claims include all the limitations of the respective independent claims from which they ultimately depend, each such dependent claim is also patentable over Epworth in view of Davenport and further in view of Davenport under 35 U.S.C. 103(a).

Therefore, the Examiner's rejection should be withdrawn.

Claim 15

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Epworth in view of Davenport and further in view of Huber and further in view of Suzuki. The rejection is traversed.

The ground of rejection applies only to dependent claims, and is predicated on the validity of the rejection under 35 U.S.C. 103 given Epworth in view of Davenport and further in view of Huber. Since the rejection under 35 U.S.C. 103 given Epworth in view of Davenport and further in view of Huber has been overcome, as described hereinabove, and there is no argument put forth by the Office Action that Suzuki supplies all the features that are missing from Epworth in view of Davenport and further in view of Huber to render the independent claims obvious, this ground of rejection cannot be maintained. As such, claim 15 is patentable under 35 U.S.C. 103(a) over Epworth in view of Davenport and further in view of Huber and further in view of Suzuki.

Therefore, the Examiner's rejection should be withdrawn.

Allowable Subject Matter

Applicant thanks Examiner for indicating that claims 3, 12 and 14 would be allowable if rewritten in independent form including all of the limitations of the base

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claim and any intervening claims. However, for reasons set forth above, Applicant submits that these claims are also allowable in their existing dependent form.

Secondary References

The secondary references made of record are noted. However, it is believed that the secondary references are no more pertinent to Applicant's disclosure than the primary references cited in the Office Action. Therefore, Applicant believes that a detailed discussion of the secondary references is not necessary for a full and complete response to this Office Action.

Conclusion

It is respectfully submitted that the Office Action's rejections have been overcome and that this application is now in condition for allowance. Reconsideration and allowance are, therefore, respectfully solicited.

If, however, the Examiner still believes that there are unresolved issues, the Examiner is invited to call Eamon Wall at (732) 530-9404 so that arrangements may be made to discuss and resolve any such issues.

Respectfully submitted,

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